

## SEQUENCE LISTING

<110> Bos, Martine Petronella  
Poolman, Jan  
Tefsen, Boris  
Tommassen, Johannes Petrus Maria

<120> Vaccine

<130> VB60639

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<141> 2006-06-23

<150> PCT/EP2004/014770

<151> 2004-12-21

<150> GB 0329837.0

<151> 2003-12-23

<150> GB0416398.6

<151> 2004-07-22

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27

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<212> PRT

<213> Neisseria meningitidis

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Arg His Ala Asn Val Gly Arg Asn Ala Phe Glu Leu Phe Leu Ile Gly

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<212> PRT

<213> Neisseria meningitidis

<400> 8

Lys Gly Lys Asn Pro Asp Glu Leu Ala Tyr Leu Ala Gly Asp Gln Lys

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				Ser	Ser	Trp
				Ser	Ser	Thr
			20		25	

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			20				25								

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Ser	Phe	Ser	Gln	Thr	Ser	Ile	Gly	Leu	Gly	Val	Leu				
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Thr Asp Asn Pro Thr Ala Gly Glu Ser Val Arg Ser Val Ser Glu Pro  
35 40 45  
Ile Gln Pro Thr Ser Leu Ser Leu Gly Ser Thr Cys Leu Phe Cys Ser  
50 55 60  
Asn Glu Ser Gly Ser Pro Glu Arg Thr Glu Ala Ala Val Gln Gly Ser  
65 70 75 80  
Gly Glu Ala Ser Ile Pro Glu Asp Tyr Thr Arg Ile Val Ala Asp Arg  
85 90 95  
Met Glu Gly Gln Ser Gln Val Gln Val Arg Ala Glu Gly Asn Val Val  
100 105 110  
Val Glu Arg Asn Arg Thr Thr Leu Asn Thr Asp Trp Ala Asp Tyr Asp  
115 120 125  
Gln Ser Gly Asp Thr Val Thr Ala Gly Asp Arg Phe Ala Leu Gln Gln  
130 135 140  
Asp Gly Thr Leu Ile Arg Gly Glu Thr Leu Thr Tyr Asn Leu Glu Gln  
145 150 155 160  
Gln Thr Gly Glu Ala His Asn Val Arg Met Glu Ile Glu Gln Gly Gly  
165 170 175  
Arg Arg Leu Gln Ser Val Ser Arg Thr Ala Glu Met Leu Gly Glu Gly  
180 185 190  
His Tyr Lys Leu Thr Glu Thr Gln Phe Asn Thr Cys Ser Ala Gly Asp  
195 200 205  
Ala Gly Trp Tyr Val Lys Ala Ala Ser Val Glu Ala Asp Arg Glu Lys  
210 215 220  
Gly Ile Gly Val Ala Lys His Ala Ala Phe Val Phe Gly Gly Val Pro  
225 230 235 240  
Ile Phe Tyr Thr Pro Trp Ala Asp Phe Pro Leu Asp Gly Asn Arg Lys  
245 250 255  
Ser Gly Leu Leu Val Pro Ser Leu Ser Ala Gly Ser Asp Gly Val Ser  
260 265 270  
Leu Ser Val Pro Tyr Tyr Phe Asn Leu Ala Pro Asn Leu Asp Ala Thr  
275 280 285  
Phe Ala Pro Ser Val Ile Gly Glu Arg Gly Ala Val Phe Asp Gly Gln

290	295	300
Val Arg Tyr Leu Arg Pro Asp Tyr Ala Gly Gln Ser Asp Leu Thr Trp		
305	310	315
Leu Pro His Asp Lys Lys Ser Gly Arg Asn Asn Arg Tyr Gln Ala Lys		320
	325	330
Trp Gln His Arg His Asp Ile Ser Asp Thr Leu Gln Ala Gly Val Asp		335
	340	345
Phe Asn Gln Val Ser Asp Ser Gly Tyr Tyr Arg Asp Phe Tyr Gly Asn		350
	355	360
Lys Glu Ile Ala Gly Asn Val Asn Leu Asn Arg Arg Val Trp Leu Asp		365
	370	375
Tyr Gly Gly Arg Ala Ala Gly Gly Ser Leu Asn Ala Gly Leu Ser Val		380
385	390	395
Leu Lys Tyr Gln Thr Leu Ala Asn Gln Ser Gly Tyr Lys Asp Lys Pro		400
	405	410
Tyr Ala Leu Met Pro Arg Leu Ser Val Glu Trp Arg Lys Asn Thr Gly		415
	420	425
Arg Ala Gln Ile Gly Val Ser Ala Gln Phe Thr Arg Phe Ser His Asp		430
	435	440
Ser Arg Gln Asp Gly Ser Arg Leu Val Val Tyr Pro Asp Ile Lys Trp		445
	450	455
Asp Phe Ser Asn Ser Trp Gly Tyr Val Arg Pro Lys Leu Gly Leu His		460
465	470	475
Ala Thr Tyr Tyr Ser Leu Asn Arg Phe Gly Ser Gln Glu Ala Arg Arg		480
	485	490
Val Ser Arg Thr Leu Pro Ile Val Asn Ile Asp Ser Gly Ala Thr Phe		495
	500	505
Glu Arg Asn Thr Arg Met Phe Gly Gly Glu Val Leu Gln Thr Leu Glu		510
	515	520
Pro Arg Leu Phe Tyr Asn Tyr Ile Pro Ala Lys Ser Gln Asn Asp Leu		525
	530	535
Pro Asn Phe Asp Ser Ser Glu Ser Ser Phe Gly Tyr Gly Gln Leu Phe		540
545	550	555
Arg Glu Asn Leu Tyr Tyr Gly Asn Asp Arg Ile Asn Thr Ala Asn Ser		560
	565	570
Leu Ser Ala Ala Val Gln Ser Arg Ile Leu Asp Gly Ala Thr Gly Glu		575
	580	585
Glu Arg Phe Arg Ala Gly Ile Gly Gln Lys Phe Tyr Phe Lys Asp Asp		590
	595	600
Ala Val Met Leu Asp Gly Ser Val Gly Lys Lys Pro Arg Asn Arg Ser		605
	610	615
Asp Trp Val Ala Phe Ala Ser Gly Ser Ile Gly Ser Arg Phe Ile Leu		620
625	630	635
Asp Ser Ser Ile His Tyr Asn Gln Asn Asp Lys Arg Ala Glu Asn Tyr		640
	645	650
Ala Val Gly Ala Ser Tyr Arg Pro Ala Gln Gly Lys Val Leu Asn Ala		655
	660	665
Arg Tyr Lys Tyr Gly Arg Asn Glu Lys Ile Tyr Leu Lys Ser Asp Gly		670
	675	680
Ser Tyr Phe Tyr Asp Lys Leu Ser Gln Leu Asp Leu Ser Ala Gln Trp		685
	690	695
Pro Leu Thr Arg Asn Leu Ser Ala Val Val Arg Tyr Asn Tyr Gly Phe		700
705	710	715
Glu Ala Lys Lys Pro Ile Glu Val Leu Ala Gly Ala Glu Tyr Lys Ser		720
	725	730
Ser Cys Gly Cys Trp Gly Ala Gly Val Tyr Ala Gln Arg Tyr Val Thr		735
	740	745
		750

Gly	Glu	Asn	Thr	Tyr	Lys	Asn	Ala	Val	Phe	Phe	Ser	Leu	Gln	Leu	Lys
		755					760					765			
Asp	Leu	Ser	Ser	Val	Gly	Arg	Asn	Pro	Ala	Asp	Arg	Met	Asp	Val	Ala
	770					775					780				
Val	Pro	Gly	Tyr	Ile	Thr	Ala	His	Ser	Leu	Ser	Ala	Gly	Arg	Asn	Lys
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Arg	Pro														

<210> 21  
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 <213> Neisseria meningitidis

<400> 21

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			20					25					30		
Thr	Asp	Asn	Pro	Thr	Ala	Gly	Gly	Ser	Val	Arg	Ser	Val	Ser	Glu	Pro
		35					40					45			
Ile	Gln	Pro	Thr	Ser	Leu	Ser	Leu	Gly	Ser	Thr	Cys	Leu	Phe	Cys	Ser
	50					55					60				
Asn	Glu	Ser	Gly	Ser	Pro	Glu	Arg	Thr	Glu	Ala	Ala	Val	Arg	Gly	Ser
65					70					75					80
Gly	Glu	Ala	Ser	Ile	Pro	Glu	Asp	Tyr	Thr	Arg	Ile	Val	Ala	Asp	Lys
				85					90					95	
Val	Glu	Gly	Gln	Ser	Gln	Val	Gln	Val	Arg	Ala	Glu	Gly	Asn	Val	Val
			100					105					110		
Val	Glu	Arg	Asn	Arg	Thr	Thr	Leu	Asn	Thr	Asp	Trp	Ala	Asp	Tyr	Asp
		115					120					125			
Gln	Ser	Gly	Asp	Thr	Val	Thr	Ala	Gly	Asp	Arg	Phe	Ala	Leu	Gln	Gln
	130					135					140				
Asp	Gly	Thr	Leu	Ile	Arg	Gly	Glu	Thr	Leu	Thr	Tyr	Asn	Leu	Glu	Gln
145					150					155					160
Gln	Thr	Gly	Glu	Ala	His	Asn	Val	Arg	Met	Glu	Thr	Glu	His	Gly	Gly
				165					170					175	
Arg	Arg	Leu	Gln	Ser	Val	Ser	Arg	Thr	Ala	Glu	Met	Leu	Gly	Glu	Gly
		180						185					190		
His	Tyr	Lys	Leu	Thr	Glu	Thr	Gln	Phe	Asn	Thr	Cys	Ser	Ala	Gly	Asp
		195					200					205			
Ala	Gly	Trp	Tyr	Val	Lys	Ala	Ala	Ser	Val	Glu	Ala	Asp	Arg	Glu	Lys
	210					215					220				
Gly	Ile	Gly	Val	Ala	Lys	His	Ala	Ala	Phe	Val	Phe	Gly	Gly	Val	Pro
225					230					235					240
Ile	Phe	Tyr	Thr	Pro	Trp	Ala	Asp	Phe	Pro	Leu	Asp	Gly	Asn	Arg	Lys
				245					250					255	
Ser	Gly	Leu	Leu	Val	Pro	Ser	Leu	Ser	Ala	Gly	Ser	Asp	Gly	Val	Ser
			260					265					270		
Leu	Ser	Val	Pro	Tyr	Tyr	Phe	Asn	Leu	Ala	Pro	Asn	Leu	Asp	Ala	Thr
		275					280					285			
Phe	Ala	Pro	Ser	Val	Ile	Gly	Glu	Arg	Gly	Ala	Val	Phe	Asp	Gly	Gln
	290					295					300				
Val	Arg	Tyr	Leu	Arg	Pro	Asp	Tyr	Ala	Gly	Gln	Ser	Asp	Leu	Thr	Trp
305					310					315					320
Leu	Pro	His	Asp	Lys	Lys	Ser	Gly	Arg	Asn	Asn	Arg	Tyr	Gln	Ala	Lys

				325					330					335			
Trp	Gln	His	Arg	His	Asp	Ile	Ser	Asp	Thr	Leu	Gln	Ala	Gly	Val	Asp		
			340					345					350				
Phe	Asn	Gln	Val	Ser	Asp	Ser	Gly	Tyr	Tyr	Arg	Asp	Phe	Tyr	Gly	Asn		
		355					360					365					
Lys	Glu	Ile	Ala	Gly	Asn	Val	Asn	Leu	Asn	Arg	Arg	Val	Trp	Leu	Asp		
	370					375					380						
Tyr	Gly	Gly	Arg	Ala	Ala	Gly	Gly	Ser	Leu	Asn	Ala	Gly	Leu	Ser	Val		
385					390					395					400		
Leu	Lys	Tyr	Gln	Thr	Leu	Ala	Asn	Gln	Ser	Gly	Tyr	Lys	Asp	Lys	Pro		
			405					410						415			
Tyr	Ala	Leu	Met	Pro	Arg	Leu	Ser	Ala	Asp	Trp	Arg	Lys	Asn	Thr	Gly		
			420					425					430				
Arg	Ala	Gln	Ile	Gly	Val	Ser	Ala	Gln	Phe	Thr	Arg	Phe	Ser	His	Asp		
		435					440					445					
Ser	Arg	Gln	Asp	Gly	Ser	Arg	Leu	Val	Val	Tyr	Pro	Asp	Ile	Lys	Trp		
	450					455				460							
Asp	Phe	Ser	Asn	Ser	Trp	Gly	Tyr	Val	Arg	Pro	Lys	Leu	Gly	Leu	His		
465					470					475					480		
Ala	Thr	Tyr	Tyr	Ser	Leu	Asn	Arg	Phe	Gly	Ser	Gln	Glu	Ala	Arg	Arg		
			485					490						495			
Val	Ser	Arg	Thr	Leu	Pro	Ile	Val	Asn	Ile	Asp	Ser	Gly	Ala	Thr	Phe		
			500					505					510				
Glu	Arg	Asn	Thr	Arg	Met	Phe	Gly	Gly	Gly	Val	Leu	Gln	Thr	Leu	Glu		
	515						520					525					
Pro	Arg	Leu	Phe	Tyr	Asn	Tyr	Ile	Pro	Ala	Lys	Ser	Gln	Asn	Asp	Leu		
	530					535					540						
Pro	Asn	Phe	Asp	Ser	Ser	Glu	Ser	Ser	Phe	Gly	Tyr	Gly	Gln	Leu	Phe		
545					550					555					560		
Arg	Glu	Asn	Leu	Tyr	Tyr	Gly	Asn	Asp	Arg	Ile	Asn	Thr	Ala	Asn	Ser		
			565					570						575			
Leu	Ser	Ala	Ala	Val	Gln	Ser	Arg	Ile	Leu	Asp	Gly	Ala	Thr	Gly	Glu		
		580						585					590				
Glu	Arg	Phe	Arg	Ala	Gly	Ile	Gly	Gln	Lys	Phe	Tyr	Phe	Lys	Asp	Asp		
	595						600					605					
Ala	Val	Met	Leu	Asp	Gly	Ser	Val	Gly	Lys	Lys	Pro	Arg	Asn	Arg	Ser		
	610					615					620						
Asp	Trp	Val	Ala	Phe	Ala	Ser	Gly	Ser	Ile	Gly	Ser	Arg	Phe	Ile	Leu		
625					630					635					640		
Asp	Ser	Ser	Ile	His	Tyr	Asn	Gln	Asn	Asp	Lys	Arg	Ala	Glu	Asn	Tyr		
			645						650					655			
Ala	Val	Gly	Ala	Ser	Tyr	Arg	Pro	Ala	Gln	Gly	Lys	Val	Leu	Asn	Ala		
			660					665					670				
Arg	Tyr	Lys	Tyr	Gly	Arg	Asn	Glu	Lys	Ile	Tyr	Leu	Lys	Ser	Asp	Gly		
	675						680					685					
Ser	Tyr	Phe	Tyr	Asp	Lys	Leu	Ser	Gln	Leu	Asp	Leu	Ser	Ala	Gln	Trp		
	690					695					700						
Pro	Leu	Thr	Arg	Asn	Leu	Ser	Ala	Val	Val	Arg	Tyr	Asn	Tyr	Gly	Phe		
705					710					715					720		
Glu	Ala	Lys	Lys	Pro	Ile	Glu	Met	Leu	Ala	Gly	Ala	Glu	Tyr	Lys	Ser		
			725						730					735			
Ser	Cys	Gly	Cys	Trp	Gly	Ala	Gly	Val	Tyr	Ala	Gln	Arg	Tyr	Val	Thr		
			740				745						750				
Gly	Glu	Asn	Thr	Tyr	Lys	Asn	Ala	Val	Phe	Phe	Ser	Leu	Gln	Leu	Lys		
	755						760					765					
Asp	Leu	Ser	Ser	Val	Gly	Arg	Asn	Pro	Ala	Asp	Arg	Met	Asp	Val	Ala		
	770					775					780						



Val	Pro	Gly	Tyr	Ile	Pro	Ala	His	Ser	Leu	Ser	Ala	Gly	Arg	Asn	Lys
785					790					795					800
Arg	Pro														

<210> 22  
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 <213> Neisseria meningitidis

<400> 22

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			20					25					30		
Thr	Asp	Asn	Pro	Thr	Ala	Gly	Glu	Ser	Val	Arg	Ser	Val	Ser	Glu	Pro
		35					40					45			
Ile	Gln	Pro	Thr	Ser	Leu	Ser	Leu	Gly	Ser	Thr	Cys	Leu	Phe	Cys	Ser
	50					55					60				
Asn	Glu	Ser	Gly	Ser	Pro	Glu	Arg	Thr	Glu	Ala	Ala	Val	Gln	Gly	Ser
65					70					75					80
Gly	Glu	Ala	Ser	Ile	Pro	Glu	Asp	Tyr	Thr	Arg	Ile	Val	Ala	Asp	Arg
				85					90					95	
Met	Glu	Gly	Gln	Ser	Gln	Val	Gln	Val	Arg	Ala	Glu	Gly	Asn	Val	Val
			100					105					110		
Val	Glu	Arg	Asn	Arg	Thr	Thr	Leu	Asn	Thr	Asp	Trp	Ala	Asp	Tyr	Asp
		115					120					125			
Gln	Ser	Gly	Asp	Thr	Val	Thr	Ala	Gly	Asp	Arg	Phe	Ala	Leu	Gln	Gln
	130					135					140				
Asp	Gly	Thr	Leu	Ile	Arg	Gly	Glu	Thr	Leu	Thr	Tyr	Asn	Leu	Glu	Gln
145					150					155					160
Gln	Thr	Gly	Glu	Ala	His	Asn	Val	Arg	Met	Glu	Ile	Glu	Gln	Gly	Gly
				165					170					175	
Arg	Arg	Leu	Gln	Ser	Val	Ser	Arg	Thr	Ala	Glu	Met	Leu	Gly	Glu	Gly
			180					185					190		
His	Tyr	Lys	Leu	Thr	Glu	Thr	Gln	Phe	Asn	Thr	Cys	Ser	Ala	Gly	Asp
		195					200					205			
Ala	Gly	Trp	Tyr	Val	Lys	Ala	Ala	Ser	Val	Glu	Ala	Asp	Arg	Glu	Lys
	210					215					220				
Gly	Ile	Gly	Val	Ala	Lys	His	Ala	Ala	Phe	Val	Phe	Gly	Gly	Val	Pro
225					230					235					240
Ile	Phe	Tyr	Thr	Pro	Trp	Ala	Asp	Phe	Pro	Leu	Asp	Gly	Asn	Arg	Lys
				245					250				255		
Ser	Gly	Leu	Leu	Val	Pro	Ser	Leu	Ser	Ala	Gly	Ser	Asp	Gly	Val	Ser
			260					265					270		
Leu	Ser	Val	Pro	Tyr	Tyr	Phe	Asn	Leu	Ala	Pro	Asn	Leu	Asp	Ala	Thr
		275					280					285			
Phe	Ala	Pro	Ser	Val	Ile	Gly	Glu	Arg	Gly	Ala	Val	Phe	Asp	Gly	Gln
	290					295					300				
Val	Arg	Tyr	Leu	Arg	Pro	Asp	Tyr	Ala	Gly	Gln	Ser	Asp	Leu	Thr	Trp
305					310					315					320
Leu	Pro	His	Asp	Lys	Lys	Ser	Gly	Arg	Asn	Asn	Arg	Tyr	Gln	Ala	Lys
				325					330					335	
Trp	Gln	His	Arg	His	Asp	Ile	Ser	Asp	Thr	Leu	Gln	Ala	Gly	Val	Asp
			340					345					350		
Phe	Asn	Gln	Val	Ser	Asp	Ser	Gly	Tyr	Tyr	Arg	Asp	Phe	Tyr	Gly	Asn

Lys	Glu	Ile	Ala	Gly	Asn	Val	Asn	Leu	Asn	Arg	Arg	Val	Trp	Leu	Asp
	370					375					380				
Tyr	Gly	Gly	Arg	Ala	Ala	Gly	Gly	Ser	Leu	Asn	Ala	Gly	Leu	Ser	Val
385					390					395					400
Leu	Lys	Tyr	Gln	Thr	Leu	Ala	Asn	Gln	Ser	Gly	Tyr	Lys	Asp	Lys	Pro
				405					410					415	
Tyr	Ala	Leu	Met	Pro	Arg	Leu	Ser	Val	Glu	Trp	Arg	Lys	Asn	Thr	Gly
			420					425					430		
Arg	Ala	Gln	Ile	Gly	Val	Ser	Ala	Gln	Phe	Thr	Arg	Phe	Ser	His	Asp
		435					440					445			
Ser	Arg	Gln	Asp	Gly	Ser	Arg	Leu	Val	Val	Tyr	Pro	Asp	Ile	Lys	Trp
	450					455					460				
Asp	Phe	Ser	Asn	Ser	Trp	Gly	Tyr	Val	Arg	Pro	Lys	Leu	Gly	Leu	His
465					470					475					480
Ala	Thr	Tyr	Tyr	Ser	Leu	Asn	Arg	Phe	Gly	Ser	Gln	Glu	Ala	Arg	Arg
				485					490					495	
Val	Ser	Arg	Thr	Leu	Pro	Ile	Val	Asn	Ile	Asp	Ser	Gly	Ala	Thr	Phe
			500					505					510		
Glu	Arg	Asn	Thr	Arg	Met	Phe	Gly	Gly	Glu	Val	Leu	Gln	Thr	Leu	Glu
		515					520					525			
Pro	Arg	Leu	Phe	Tyr	Asn	Tyr	Ile	Pro	Ala	Lys	Ser	Gln	Asn	Asp	Leu
	530					535					540				
Pro	Asn	Phe	Asp	Ser	Ser	Glu	Ser	Ser	Phe	Gly	Tyr	Gly	Gln	Leu	Phe
545					550					555					560
Arg	Glu	Asn	Leu	Tyr	Tyr	Gly	Asn	Asp	Arg	Ile	Asn	Thr	Ala	Asn	Ser
				565					570					575	
Leu	Ser	Ala	Ala	Val	Gln	Ser	Arg	Ile	Leu	Asp	Gly	Ala	Thr	Gly	Glu
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Glu	Arg	Phe	Arg	Ala	Gly	Ile	Gly	Gln	Lys	Phe	Tyr	Phe	Lys	Asp	Asp
		595					600					605			
Ala	Val	Met	Leu	Asp	Gly	Ser	Val	Gly	Lys	Lys	Pro	Arg	Asn	Arg	Ser
	610					615					620				
Asp	Trp	Val	Ala	Phe	Ala	Ser	Gly	Ser	Ile	Gly	Ser	Arg	Phe	Ile	Leu
625					630					635					640
Asp	Ser	Ser	Ile	His	Tyr	Asn	Gln	Asn	Asp	Lys	Arg	Ala	Glu	Asn	Tyr
				645					650					655	
Ala	Val	Gly	Ala	Ser	Tyr	Arg	Pro	Ala	Gln	Gly	Lys	Val	Leu	Asn	Ala
			660					665					670		
Arg	Tyr	Lys	Tyr	Gly	Arg	Asn	Glu	Lys	Ile	Tyr	Leu	Lys	Ser	Asp	Gly
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 <213> *Neisseria meningitidis*

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 Gln Thr Gly Glu Ala His Asn Val Arg Met Glu Thr Glu His Gly Gly  
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<212> PRT

<213> *Neisseria meningitidis*

<400> 24

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<212> DNA

<213> *Neisseria meningitidis*

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<212> DNA

<213> *Neisseria meningitidis*

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